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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,731	01/18/2002	Jonathan Christopher Hardwick	MS183174.1/40062.164US01	4229

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EXAMINER	
SHARON, AYAL I	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/053,731	HARDWICK ET AL.	
	Examiner	Art Unit	
	Ayal I. Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *14* is/are allowed.

6)☒ Claim(s) *1-13,15-21,25-34 and 36-45* is/are rejected.

7)☒ Claim(s) *22-24 and 35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/21/04, 9/22/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claims 1-45 of U.S. Application 10/053,731 filed on 01/18/2002 are presented for examination.

Claim Interpretations

2. Examiner interprets "system" claim 14, and "evaluation engine" claim 33 as being apparatus claims.
3. Examiner interprets that the "resource contention timeline" in claim 34 corresponds to the "event horizon" in claim 1.

Specification

4. The disclosure is objected to because of the following informalities: the serial number of the co-pending application should be identified. Appropriate correction is required.

Allowable Subject Matter

5. Claims 3-5, 14, 22-24, 35, and 37 all claim an "event horizon" and "calculating an aggregate resource requirement", which are limitations taught by Papaefsthiou.

On the other hand, the Papaefstathiou reference does not expressly teach a "resource topology tree".

The Steinman reference (U.S. Patent 5,850,538) teaches the use of such a "topology tree" (See especially: column 2, lines 45-50; and columns 10-12 and 14-15) in combination with an "event horizon" (See especially: col.5, line 65 to col.6, line 50), but does not expressly teach "calculating an aggregate resource requirement".

While at first glance a combination of these two references appears to be appropriate, it would be improper as per 35 U.S.C. § 103 (c).

6. Claim 14 is therefore allowed.
7. Claims 22-24 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. Claims 3-5 and 37 are rejected under 35 USC § 112. The full rejection appears on the following page.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. **Claims 15-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

11. The claims are directed to data structures stored on a computer readable medium. The claim limitations describe non-functional aspects of the object definition. Additionally, the claim lacks a positive recitation that what is claimed is a carrier medium having executable computer code that when executed causes a computer to perform functional steps. As currently written, the claimed computer program and storage medium appears to consist of non-functional descriptive material; see MPEP § 2106, subsection IV.B.1(a).

Claim Rejections - 35 USC § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. **Claims 1-13 and 36-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.** The term "computer program product" is vague and indefinite. It is not clear if this refers to a computer running a program, a program embedded on computer-readable media, a program running from RAM, etc. All dependent claims inherit this defect.

14. The specification regarding the claimed invention is deficient in the areas cited above. Accordingly, the examiner has made prior art rejections based on the limited scope of information contained in the specification for supporting the

claims. The rejections are complete and specifically applied against the claims based on this limited disclosure.

Claim Rejections - 35 USC § 102(b)

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. The prior art used for these rejections is as follows:

17. Steinman, U.S. Patent 5,850,538. (Henceforth referred to as "**Steinman**").

18. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

19. **Claims 38-41 and 42-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Steinman.**

20. In regards to Claim 38, Steinman teaches the following limitations:

38. A computer program product encoding a computer program for executing on a computer system a computer process for associating a resource with a resource contention timeline during a performance prediction simulation of a system, the computer process comprising:

providing a resource configuration based on a hierarchical resource topology tree;
(See especially: column 2, lines 45-50; and columns 10-12 and 14-15)

identifying a resource in the system, as specified by the resource configuration;
(See especially: column 2, lines 45-50; and columns 10-12 and 14-15)

Examiner interprets that the "resource in the system" is time.

associating a resource contention timeline with the resource, wherein the resource contention timeline describes an amount of the resource consumed during the performance prediction simulation of the system.
(See especially: col.5, line 65 to col.6, line 50)

21. In regards to Claim 39, Steinman teaches the following limitations:

39. The computer program product of claim 38 wherein the resource represents an active resource in the system and is associated with a hardware model capable of contributing to a specified resource type, and the associating operation comprises:

traversing up the hierarchical resource topology tree from the active resource to identify another resource having a declared resource contention timeline associated with the specified resource type; and
(See especially: column 2, lines 45-50; and columns 10-12 and 14-15)

Examiner interprets the "another resource" as being computation time on another CPU.

associating the active resource with the declared resource contention timeline.
(See especially: column 2, lines 45-50; col.5, line 65 to col.6, line 50)

22. In regards to Claim 40, Steinman teaches the following limitations:

40. The computer program product of claim 39 wherein the other resource identified in the traversing operation is at a higher level of hierarchy in the hierarchical resource topology tree.
(See especially: column 2, lines 45-50; and columns 10-12 and 14-15)

23. In regards to Claim 41, Steinman teaches the following limitations:

41. The computer program product of claim 39 wherein the other resource is the first higher-level resource encountered during the traversing operation from the active resource that is associated with a resource contention timeline of the specified resource type.
(See especially: column 2, lines 45-50; and columns 10-12 and 14-15)

24. **Claims 42-45 are rejected based on the same reasoning as claims 38-41, *supra*. Claims 42-45 are method claims that recite the same limitations that are recited in computer program product claims 38-41.**

Claim Rejections - 35 USC § 102(e)

25. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

26. The prior art used for these rejections is as follows:

27. Papaefstathiou et al., U.S. Patent 6,925,431. (Henceforth referred to as "**Papaefstathiou**").

28. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

29. **Claims 1-2, 6-13, 15-19, 20-21, 25-32, 34, and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Papaefstathiou.**

30. In regards to Claim 1, Papaefstathiou teaches the following limitations:

1. A computer program product encoding a computer program for executing on a computer system a computer process for determining an amount of a resource consumed during a simulation interval in a performance prediction simulation of a system including software and hardware elements, the computer process comprising:

calculating an aggregate resource requirement associated with the resource in a simulation interval;
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

calculating a system event horizon for the simulation interval based on a resource usage state change in the system; and
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

adjusting the aggregate resource requirement based on the system event horizon to provide an adjusted aggregate resource requirement for the resource, wherein the adjusted aggregate resource requirement represents the amount of the resource consumed during the simulation interval.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

31. In regards to Claim 2, Papaefstathiou teaches the following limitations:

2. The computer program product of claim 1 wherein the computer process further comprises:

advancing a simulation clock to the system event horizon to start a next simulation interval.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

32. In regards to Claim 6, Papaefstathiou teaches the following limitations:

6. The computer program product of claim 1 wherein the operation of calculating an aggregate resource requirement comprises:

receiving one or more resource requirement contributions from one or more hardware models, each hardware model representing a resource associated with a resource contention timeline; and
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

combining the resource requirement contributions from the one or more hardware models to provide the aggregate resource requirement.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

33. In regards to Claim 7, Papaefstathiou teaches the following limitations:

7. The computer program product of claim 6 wherein the combining operation comprises:

adding the resource requirement contributions together.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

34. In regards to Claim 8, Papaefstathiou teaches the following limitations:

8. The computer program product of claim 6 wherein the combining operation comprises:

performing a bitwise OR operation on the resource requirement contributions.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

35. In regards to Claim 9, Papaefstathiou teaches the following limitations:

9. The computer program product of claim 1 wherein the operation of calculating a system event horizon comprises:

determining a minimum event duration of active events to provide a resource event horizon;
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

determining a workload event horizon based a start time of a newly activated event; and

(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

selecting an earlier one of the resource event horizon or the workload event horizon to provide the system event horizon.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

36. In regards to Claim 10, Papaefstathiou teaches the following limitations:

10. The computer program product of claim 1 wherein the operation of calculating a system event horizon comprises:

passing an aggregate resource requirement to a hardware model to determine a duration of an active event;
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

calculates in the hardware model the duration of the active event based on resource contention defined by the aggregate resource requirement.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

37. In regards to Claim 11, Papaefstathiou teaches the following limitations:

11. The computer program product of claim I wherein the computer process further comprises:

creating a resource contention timeline entry storing the adjusted aggregate resource requirement, an identifier of the associated resource, and a start time; and
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

inserting the resource contention timeline entry into a resource contention timeline corresponding to the associated resource.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

38. In regards to Claim 12, Papaefstathiou teaches the following limitations:

12. The computer program product of claim 11 wherein the computer process further comprises:

presenting the resource contention timeline on a video display in a graphical format.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

39. In regards to Claim 13, Papaefstathiou teaches the following limitations:

13. The computer program product of claim 11 wherein the computer process further comprises:

presenting the resource contention timeline on a video display in a text format.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

40. In regards to Claim 15, Papaefstathiou teaches the following limitations:

15. A computer readable medium having stored thereon a data structure for recording resource contention of a system under simulation, the data structure being associated with a resource in the system, the data structure comprising:

a first data field containing data representing a start time for a simulation interval in a performance simulation system simulating performance of the system; and
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

a second data field containing data representing an amount of the resource used during the simulation interval by the system.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

41. In regards to Claim 16, Papaefstathiou teaches the following limitations:

16. The computer readable medium of claim 15 wherein the data structure fiurther comprises:

a fourth data field containing the duration of the simulation interval.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

42. In regards to Claim 17, Papaefstathiou teaches the following limitations:

17. The computer readable medium of claim 15 wherein the data structure further comprises:

a fourth data field containing the duration that the amount of resource used is valid, relative to the start time, during the simulation.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

43. In regards to Claim 18, Papaefstathiou teaches the following limitations:

18. The computer readable medium of claim 15 wherein the first data field, the second data field and the third data field are included in a first resource contention timeline entry and the data structure further comprises:

a second resource contention timeline entry logically coupled in sequence with the first resource timeline entry to define usage of the resource in the system during a plurality of simulation intervals.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

44. In regards to Claim 19, Papaefstathiou teaches the following limitations:

19. The computer readable medium of claim 18 wherein a duration of the simulation interval associated with the first resource contention timeline entry is based on the difference between the start time of the second resource contention timeline entry and the start time of the first resource contention timeline entry.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

45. In regards to Claim 34, Papaefstathiou teaches the following limitations:

34. A method of determining an amount of a resource consumed during a performance prediction simulation of a system, the method comprising:

defining a resource configuration of the system to include at least one resource;
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

associating the at least one resource with a resource contention timeline;
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

calculating an amount of the resource used during one or more simulation intervals of the performance prediction simulation; and
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

inserting a resource contention timeline entry for each of the one or more simulation intervals into the resource contention timeline, each resource contention timeline entry specifying an amount of the resource used during the simulation interval associated with the resource contention timeline entry.
(See Papaefstathiou, especially: Fig.6, Items 308-316 and associated text; col.4, lines 12-46; col.13, lines 3-15; and col.15, lines 19-39)

46. Claims 20-21, and 25-32 are rejected based on the same reasoning as claims 1-2, and 6-13, *supra*. Claims 20-21, and 25-32 are method claims that recite the same limitations that are recited in computer program product claims 1-2, and 6-13.

47. Claim 33 is rejected based on the same reasoning as claim 1, *supra*. Claim 33 is an evaluation engine method claims that recites a subset of identical limitations to those recited in computer program product claim 1.

48. Claim 36 is rejected based on the same reasoning as claim 34, *supra*. Claim 36 is a computer program product claim that recites the same limitations that are recited in method claim 34.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached at (571) 272-3749.

Any response to this office action should be faxed to (571) 273- 8300, or mailed to:

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or hand carried to:

USPTO
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2100 Receptionist, whose telephone number is (571) 272-2100.

Ayal I. Sharon

Art Unit 2123

August 8, 2005

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100